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| USPT | (content near based and filter\$ and search near engine\$.ti. | 0 | <u>L3</u> |
| USPT | content near based and filter\$ and search near engine\$ and informon\$ | 3 | <u>L2</u> |
| USPT | content near based and filter\$ and search near engine\$ | 63 | <u>L1</u> |

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L2: Entry 1 of 3

File: USPT

Feb 22, 2000

US-PAT-NO: 6029161

DOCUMENT-IDENTIFIER: US 6029161 A

TITLE: Multi-level mindpool system especially adapted to provide collaborative
filter data for a large scale information filtering system

DATE-ISSUED: February 22, 2000

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|------------------|------------|-------|----------|---------|
| Lang; Andrew K. | Pittsburgh | PA | N/A | N/A |
| Kosak; Donald M. | Pittsburgh | PA | N/A | N/A |

ASSIGNEE INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|-------------|---------|-------|----------|---------|-----------|
| Lycos, Inc. | Waltham | MA | N/A | N/A | 02 |

APPL-NO: 9/ 195709

DATE FILED: November 19, 1998

PARENT-CASE:

This application is a divisional of application Ser. No. 08/627,436, filed on Apr. 4, 1996 and now U.S. Pat. No. 5,867,799, the entire contents of which are hereby incorporated by reference.

INT-CL: [7] G06F 17/30

US-CL-ISSUED: 707/1; 707/10, 707/102

US-CL-CURRENT: 707/1; 707/10, 707/102

FIELD-OF-SEARCH: 707/1, 707/10, 707/102

REF-CITED:

U.S. PATENT DOCUMENTS

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L2: Entry 2 of 3

File: USPT

Nov 9, 1999

US-PAT-NO: 5983214

DOCUMENT-IDENTIFIER: US 5983214 A

TITLE: System and method employing individual user content-based data and user collaborative feedback data to evaluate the content of an information entity in a large information communication network

DATE-ISSUED: November 9, 1999

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|------------------|------------|-------|----------|---------|
| Lang; Andrew K. | Pittsburgh | PA | N/A | N/A |
| Kosak; Donald M. | Pittsburgh | PA | N/A | N/A |

ASSIGNEE INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|-------------|---------|-------|----------|---------|-----------|
| Lycos, Inc. | Waltham | MA | N/A | N/A | 02 |

APPL-NO: 9/ 186407

DATE FILED: November 5, 1998

PARENT-CASE:

This application is a continuation of application Ser. No. 08/627,436, filed Apr. 4, 1996, now U.S. Pat. No. 5,867,799.

INT-CL: [6] G06F 17/30

US-CL-ISSUED: 707/1; 707/10, 348/1

US-CL-CURRENT: 707/1; 707/10, 725/116

FIELD-OF-SEARCH: 707/1, 707/10, 707/3, 707/5, 348/1

REF-CITED:

U.S. PATENT DOCUMENTS

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☐ 1. Document ID: US 6029161 A

L2: Entry 1 of 3

File: USPT

Feb 22, 2000

US-PAT-NO: 6029161

DOCUMENT-IDENTIFIER: US 6029161 A

TITLE: Multi-level mindpool system especially adapted to provide collaborative filter data for a large scale information filtering system

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw Desc | Image |
|------|-------|----------|-------|--------|----------------|------|-----------|--------|------|-----------|-------|
|------|-------|----------|-------|--------|----------------|------|-----------|--------|------|-----------|-------|

☐ 2. Document ID: US 5983214 A

L2: Entry 2 of 3

File: USPT

Nov 9, 1999

US-PAT-NO: 5983214

DOCUMENT-IDENTIFIER: US 5983214 A

TITLE: System and method employing individual user content-based data and user collaborative feedback data to evaluate the content of an information entity in a large information communication network

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw Desc | Image |
|------|-------|----------|-------|--------|----------------|------|-----------|--------|------|-----------|-------|
|------|-------|----------|-------|--------|----------------|------|-----------|--------|------|-----------|-------|

☐ 3. Document ID: US 5867799 A

L2: Entry 3 of 3

File: USPT

Feb 2, 1999

US-PAT-NO: 5867799

DOCUMENT-IDENTIFIER: US 5867799 A

TITLE: Information system and method for filtering a massive flow of information entities to meet user information classification needs

| Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw Desc | Image |
|------|-------|----------|-------|--------|----------------|------|-----------|--------|------|-----------|-------|
|------|-------|----------|-------|--------|----------------|------|-----------|--------|------|-----------|-------|

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| Terms | Documents |
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Search Results -

| Terms | Documents |
|---|-----------|
| content near based and filter\$ and search near engine\$ and informon\$ | 3 |

Database:

US Patents Full-Text Database
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Refine Search:

content near based and filter\$ and
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[Clear](#)**Search History****Today's Date: 12/2/2000**

| <u>DB Name</u> | <u>Query</u> | <u>Hit Count</u> | <u>Set Name</u> |
|----------------|---|------------------|-----------------|
| USPT | content near based and filter\$ and search near engine\$ and informon\$ | 3 | <u>L2</u> |
| USPT | content near based and filter\$ and search near engine\$ | 63 | <u>L1</u> |

WEST**End of Result Set**☐ **Generate Collection**

L2: Entry 3 of 3

File: USPT

Feb 2, 1999

US-PAT-NO: 5867799

DOCUMENT-IDENTIFIER: US 5867799 A

TITLE: Information system and method for filtering a massive flow of information entities to meet user information classification needs

DATE-ISSUED: February 2, 1999

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|------------------|------------|-------|----------|---------|
| Lang; Andrew K. | Pittsburgh | PA | 15217 | N/A |
| Kosak; Donald M. | Pittsburgh | PA | 15202 | N/A |

APPL-NO: 8/ 627436

DATE FILED: April 4, 1996

INT-CL: [6] G06F 17/30

US-CL-ISSUED: 707/1; 707/10

US-CL-CURRENT: 707/1; 707/10

FIELD-OF-SEARCH: 395/603, 395/605, 395/610, 395/149, 395/66, 348/7, 364/419.19, 364/192, 707/1, 707/10

REF-CITED:

U.S. PATENT DOCUMENTS

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| | PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|--------------------------|----------------|----------------|------------------|------------|
| <input type="checkbox"/> | <u>5019961</u> | May 1991 | Addesso et al. | 364/192 |
| <input type="checkbox"/> | <u>5117349</u> | May 1992 | Tirfing et al. | 395/605 |
| <input type="checkbox"/> | <u>5249262</u> | September 1993 | Baule | 395/66 |
| <input type="checkbox"/> | <u>5471610</u> | November 1995 | Kawaguchi et al. | 395/603 |
| <input type="checkbox"/> | <u>5537586</u> | July 1996 | Amram et al. | 395/605 |
| <input type="checkbox"/> | <u>5544049</u> | August 1996 | Henderson et al. | 364/419.19 |
| <input type="checkbox"/> | <u>5563998</u> | October 1996 | Yaksich et al. | 395/149 |
| <input type="checkbox"/> | <u>5563999</u> | October 1996 | Yaksich et al. | 395/149 |
| <input type="checkbox"/> | <u>5608447</u> | March 1997 | Farry et al. | 348/7 |
| <input type="checkbox"/> | <u>5649186</u> | July 1997 | Ferguson | 395/610 |

OTHER PUBLICATIONS

Knowles, Software Agent Technoly Delivers Customized Information for BBN's PIN, Dialogue, pp. 62-63, May 1995.

Resnick et al, Open Archeticture for Collaboration Filtering of Netnews, IDS, pp.

1-12, Mar. 1994.

Goldberg et al. Using Collaborative Filtering to Weave an Information Tapestry, IDS, pp. 61-70, Dec. 1992.

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Susan Dumais, et al. Using Latent Semantic Analysis to Improve Access to Textual Information. In Proceedings of CHI-88 Conference on Human Factors in Computing Systems. (1988, New York: ACM).

David Evans et al. A Summary of the CLARIT Project. Technical Report, Laboratory for Computational Linguistics, Carnegie-Mellon University, Sep. 1991.

G. Fischer and C. Stevens. Information Access in Complex, Poorly Structured Information Spaces. In Proceedings of CHI-91 Conference on Human Factors in Computing Systems. (1991: ACM).

D. Goldberg, et al. Using Collaborative Filtering to Weave an Information Tapestry. Communications of the ACM, 35, 12 (1992), pp. 61-70.

Simon Haykin. Adaptive Filter Theory. Prentice-Hall, Englewood Cliffs, NJ (1986), pp. 100-380.

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C. E. Shannon. A Mathematical Theory of Communication. Bell Sys. Tech. Journal, 27:379-423 (1948).

Beerud Sheth. A Learning Approach to Personalized Information Filtering, Master's Thesis, Massachusetts Institute of Technology, Feb., 1994.

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T.W. Yan et al. Index Structures for Selective Dissemination of Information. Technical Report STAN-CS-92-1454, Stanford University (1992).

Yiming Yang. An Example-Based Mapping Method for Text Categorization and Retrieval. ACM Transactions on Information Systems. vol. 12, No. 3, Jul. 1994, pp. 252-277.

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Coby; Frantz

ATTY-AGENT-FIRM: Morgan, Lewis & Bockius LLP

ABSTRACT:

An apparatus, method, and computer program product for information filtering in a computer system receiving a data stream from a computer network, the data stream having raw informons embedded therein, at least one of the raw informons being of interest to a user, the user being a member client of a community. The method includes the steps of providing a dynamic informon characterization having profiles encoded therein, including an adaptive content profile and an adaptive collaboration profile; adaptively filtering the raw informons responsive to the dynamic informon characterization, and producing a proposed informon; presenting the proposed informon to the user; receiving a feedback profile from the user, responsive to the proposed informon; adapting the adaptive content profile, the adaptive collaboration profile, or both responsive to the feedback profile; and updating the dynamic informon characterization responsive to the previous adapting step. The apparatus includes a plurality of processors for providing interactive, distributed filtering of information, extracted from a computer network data stream in response to multiple attribute profiles.

138 Claims, 7 Drawing figures

| | PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|--------------------------|----------------|----------------|------------------|------------|
| <input type="checkbox"/> | <u>5019961</u> | May 1991 | Addesso et al. | 364/192 |
| <input type="checkbox"/> | <u>5117349</u> | May 1992 | Tirfing et al. | 707/5 |
| <input type="checkbox"/> | <u>5249262</u> | September 1993 | Baule | 395/66 |
| <input type="checkbox"/> | <u>5471610</u> | November 1995 | Kawaguchi et al. | 707/4 |
| <input type="checkbox"/> | <u>5537586</u> | July 1996 | Amram et al. | 707/3 |
| <input type="checkbox"/> | <u>5544049</u> | August 1996 | Henderson et al. | 364/419.19 |
| <input type="checkbox"/> | <u>5563998</u> | October 1996 | Yaksich et al. | 395/149 |
| <input type="checkbox"/> | <u>5563999</u> | October 1996 | Yaksich et al. | 395/149 |
| <input type="checkbox"/> | <u>5608447</u> | March 1997 | Farry et al. | 348/7 |
| <input type="checkbox"/> | <u>5649186</u> | July 1997 | Ferguson | 707/10 |
| <input type="checkbox"/> | <u>5842199</u> | November 1998 | Miller et al. | 707/2 |
| <input type="checkbox"/> | <u>5867799</u> | February 1999 | Lang et al. | 707/1 |
| <input type="checkbox"/> | <u>5884282</u> | March 1999 | Robinson | 705/27 |

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Coby; Frantz

ATTY-AGENT-FIRM: Testa, Hurwitz & Thibeault, LLP

ABSTRACT:

A mindpool system develops collaboration informon rating data for use in filtering informons for a current user of a filter system. A plurality of commonly characterized user nodes are arranged in a 3-level heirarchical structure. Users input informon rating data to the bottom nodes. A mindpool manager system routes rating data received for an informon in any one user node to other user nodes in any node level according to selected criteria. This system distributes the rating data to selected users through bottom level nodes for use in filtering operations subsequently performed for the selected users. A common user characteristic applied to user nodes is increasingly generalized with upward node location and is increasingly detailed with downward node location. A mindpool manager operates for each user node to determine routings of the informon rating data to other user nodes. The mindpool system has a plurality of the heirarchical user node structures, with each operated for a specific informon rating purpose, such as quality. The mindpool is embodied in a filter structure having a content-based filter containing content profile data for an individual user and generating informon profile data representing information in a network sourced informon. The filter structure integrates the operation of the mindpool system and the content-based filter by combining the informon profile data, the content profile data, and received collaboration user rating data corresponding to the network informon to determine a value of the network informon to the individual user.

17 Claims, 7 Drawing figures

| PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|----------------------------------|----------------|------------------|------------|
| <input type="checkbox"/> 5019961 | May 1991 | Addesso et al. | 364/192 |
| <input type="checkbox"/> 5117349 | May 1992 | Tirfing et al. | 395/605 |
| <input type="checkbox"/> 5249262 | September 1993 | Baule | 395/66 |
| <input type="checkbox"/> 5471610 | November 1995 | Kawaguchi et al. | 395/603 |
| <input type="checkbox"/> 5537586 | July 1996 | Amram et al. | 395/605 |
| <input type="checkbox"/> 5544049 | August 1996 | Henderson et al. | 364/419.19 |
| <input type="checkbox"/> 5563998 | October 1996 | Yaksich et al. | 395/149 |
| <input type="checkbox"/> 5563999 | October 1996 | Yaksich et al. | 395/149 |
| <input type="checkbox"/> 5608447 | March 1997 | Farry et al. | 348/7 |
| <input type="checkbox"/> 5649186 | July 1997 | Ferguson | 395/610 |
| <input type="checkbox"/> 5867799 | February 1999 | Lang et al. | 707/1 |

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Goldberg et al, Using Collaborative Filtering to Weave an Information Tapestry, IDS, pp. 61-70, Dec. 1992.

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Susan Dumais, et al. Using Latent Semantic Analysis to Improve Access to Textual Information. In Proceedings of CHI-88 Conference on Human Factors in Computing Systems, New York: ACM, 1998.

David Evans et al. A Summary of the CLARIT Project. Technical Report, Laboratory for Computational Linguistics, Carnegie Melon University, Sep. 1991.

G. Fisher and C. Stevens. Information Access in Complex, Poorly Structured Information Spaces. In Proceedings of CHI-91 Conference on Human Factors in Computing Systems, ACM, 1991.

Simon Haykin, Adaptive, Filter Theory. Prentice-Hall, englewood Clffs, NJ, pp. 100-380, 1986.

Simon Haykin. Neural Networks: A Comprehensive Foundation. Macmillian College Publishing Co., New York, pp. 18-589, 1994.

Yezdi Lashkari et al. Collaborative Interface Agents. In Conference of the American Association for Artificial Intelligence. Seattle, WA, Aug. 1994.

Paul Resnick, et al. Grouplens: An Open Architecture for Collaborative Filtering of Netnews. In Proceeding of ACM 1994 Conference on Computer Supported Cooperative Work. pp. 175-186, 1994.

Anil Rewari, et al. Al Research and Applications In Digital's Service Organization. Al Magazine: pp. 68-69, 1992.

J. Rissanen. Modeling by Shortest Data Description, Automatica, 14:465-471, 1978.

Gerard Salton. developments in Automatic Text Retrieval Science, 253:974-980, Aug. 1991.

C. E. Shannon. A Mathematical Theory of Communication. Bell Sys. Tech. Journal, 27:379-423, 1948.

Beerud Sheth. A Learning Approach to Personalized Information Filtering, Master's Thesis, Massachusetts Institute of Technology, Feb. 1994.

F. Mosteller, et al. Applied Bayesian and Classical Inference: The Case of the Federalist Papers. Springer-Verlag, New York, pp. 65-66, 1984.

T. W. Yan et al. Index Structures for Selective Dissemination of Information. Technical Report STAN-CS-92-1454, Stanford University, 1992.

Yiming Yang. An Example-Based Mapping Mehod for Text Categorization and Retrieval. ACM Transactions on Information Systems. Vol. 12, 3, pp. 252-277, Jul. 1994.

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Coby; Frantz

ATTY-AGENT-FIRM: Testa, Hurwitz & Thibault, LLP

ABSTRACT:

An information entity rating system includes a content subsystem having a structured data sub-subsystem and an unstructured data sub-subsystem. The content subsystem receives content-based profile data for an information entity and separately processes structured and unstructured data to combine content-based profile data for an individual system user with the content-based profile data for the information entity to determine computed rating functions indicating structured and unstructured content-based value of the information entity to the user. A collaboration subsystem receives collaborative input data for the information entity and for processes the collaborative input data to determine at least one computed collaborative rating function indicating a collaboration-based value of the information entity to the user. A correlation subsystem receives data from the content subsystem and from the collaboration subsystem to determine exceptions to the computed rating functions on the basis of comparisons of data included in the content-based and collaboration data and to generate an exception data value function indicating an opposing value to at least one of the content-based and collaboration values. An output system combines the structured content-based, unstructured content-based, and collaboration-based value functions, and the exception data value function in generating an output rating predictor of the informon for consideration by the user.

21 Claims, 7 Drawing figures